

APOLLO

Electrochemistry

FBISE Chemistry Class 10 (SSC-II)

Domain B: Physical Chemistry

25 questions | questions

Original FBISE question crops. National Curriculum 2022-23 topic.

Q1. Fill the relevant bubble against each question according to the curriculum. Each part carries one mark.

	Question	A	B	C	D	A	B
i	A student places a piece of dry ice (solid CO ₂) in a sealed container. After a while, the container expands and may even burst. What is the best explanation for this?	The dry ice melted and turned into liquid, increasing volume.	The dry ice reacted with oxygen to form new compounds	The dry ice sublimed, producing gas that increases pressure.	The container absorbed external heat, causing it to burst	☐	☐
ii	What is the direction of flow of electrons in an electrolytic cell?	Anode to cathode externally	Anode to cathode internally	Cathode to anode externally	Cathode to anode in the solution	☐	☐

Q. 2	Attempt the following questions (10x3 = 30)			
(i)	Based on the given standard electrode potential (E°) values, arrange the following metals in order of increasing reactivity. Explain how electrode potential relates to metal reactivity. $\text{Mg}^{2+} + 2\text{e}^- \rightarrow \text{Mg} \quad E^\circ = -2.37$ $\text{Cu}^{2+} + 2\text{e}^- \rightarrow \text{Cu} \quad E^\circ = +0.34$ $\text{Ni}^{2+} + 2\text{e}^- \rightarrow \text{Ni} \quad E^\circ = -0.25$	1+2	OR	A gas sample has a volume of 2.24 dm ³ at room temperature and pressure. Calculate the number of moles of gas does it contain?

Q. 2	Attempt the following questions			(10x3 = 30)
(i)	Based on the given standard electrode potential (E°) values, arrange the following metals in order of increasing reactivity. Explain how electrode potential relates to metal reactivity. $\text{Mg}^{2+} + 2e^- \rightarrow \text{Mg} \quad E^\circ = -2.37$ $\text{Cu}^{2+} + 2e^- \rightarrow \text{Cu} \quad E^\circ = +0.34$ $\text{Ni}^{2+} + 2e^- \rightarrow \text{Ni} \quad E^\circ = -0.25$	1+2	OR	A gas sample has a volume of 72 dm^3 at room temperature and pressure. How many moles of gas does it contain? 03
(ii)	The Contact Process is an industrial method for sulfuric acid production. a. Write the balanced symbol equation for conversion of sulfur dioxide to sulfur trioxide in the Contact process. b. Identify the sources of sulfur dioxide and oxygen in this process. c. What are the typical conditions for the conversion of sulfur dioxide to sulfur trioxide?	1+1 +1	OR	a. What is molarity? How can you convert molarity to g/dm^3 ? b. What is the molarity of a solution made by dissolving 98 g of H_2SO_4 in 1 dm^3 of water? (Molar mass of $\text{H}_2\text{SO}_4 = 98 \text{ g/mol}$) 1.5+ 1.5
(iii)	A sample of calcium carbonate (CaCO_3) contains 20 grams of calcium. What is the mass of carbon dioxide (CO_2) produced when the calcium carbonate is heated?	03	OR	Draw structural formula of following a. Pent-2-ene b. But-1-ol c. Pentanoic acid 1+1+ 1
(iv)	a. What is a polymer? b. Name the basic building blocks of polymers. c. Which polymer is commonly used to make plastic bottles?	1+1 +1	OR	Draw the structure showing how protein molecule is formed, clearly highlighting the peptide linkages within the structure. 2+1
(v)	Write the chemical equations for the reactions of: a. Zinc with steam. b. Magnesium with hydrochloric acid. c. Sodium with cold water.	1+1 +1	OR	a) What are the reactants in a hydrogen-oxygen fuel cell? b) Which electrode in a hydrogen-oxygen fuel cell undergoes oxidation c) Write the overall reaction equation for a hydrogen-oxygen fuel cell. 03

(x)	Zinc plating is carried out to prevent iron from corrosion. Describe its complete process and chemical reactions taking place at anode and cathode.	1.5 + 1.5	OR
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Q.5	a) Draw a schematic diagram for the electrolysis of dilute copper(II) sulphate using inert or copper electrodes. b) Label the anode, cathode, electrolyte, and the direction of ion movement. c) Describe the observations and products formed at each electrode	2+2 +2
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First Annual 2025 | Section B Q2(xi) OR | 3 marks

OR	What is meant by Electrorefining of copper? Write down reactions occurring at anode and cathode. کاپر کی الیکٹرو فائینگ کیا ہے؟ آنوڈ اور کیتھوڈ پر رونے والے کیمیائی مساوات لکھیں۔	03
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Second Annual 2025 | Section B Q2(v) OR | 3 marks

	Briefly describe the electrorefining of copper. Show the reactions at electrodes also. کاپر کی الیکٹرو فائینگ مختصر بیان کریں۔ نیز آنوڈ اور کیتھوڈ پر رونے والے کیمیائی مساوات لکھیں۔	03
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First Annual 2026 | Section B Q2(i) | 3 marks

	Given the standard electrode potentials of zinc (−0.76 V) and copper (+0.34 V), identify which metal is more reactive? Justify your answer. زینک اور کاپر کی معیاری الیکٹروڈ پوٹینشلز دی گئی ہیں۔ ان کی بنیاد پر یہ بتائیں کہ کونسا فلز زیادہ ری ایکٹو ہے۔ اپنے جواب کو ثابت کریں۔
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First Annual 2026 | Section B Q2(iv) OR | 3 marks

	Give three applications of electroplating. الیکٹرو پلٹنگ کی تین ایپلیکیشنز تحریر کریں۔	1x3
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First Annual 2026 | Section B Q2(vii) | 3 marks

	Enlist any three advantages of Hydrogen-Oxygen fuel cell. ہائیڈروجن آکسیجن فیول سیل کے کوئی سے تین فوائد لکھیں۔	1x3
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First Annual 2026 | Section C Q6 | 4 marks

Q.6	What happens during the electrolysis of dilute copper sulphate using copper electrodes? Also give the equations of chemical reactions occurring at both electrodes. ڈیلیوٹ کاپر سلفیٹ کے محلول کی الیکٹرو لیس جب کاپر کے الیکٹروڈز کے ذریعے کی	2+2
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First Annual 2026 | Section A Q1 | 1 mark

Which half-equation occurs at the anode during electrolysis of molten NaCl?	$2\text{Cl}^- \rightarrow \text{Cl}_2 + 2\text{e}^-$	$\text{Na}^+ + \text{e}^- \rightarrow \text{Na}$	$\text{Cl}_2 + 2\text{e}^- \rightarrow 2\text{Cl}^-$	$\text{Na} \rightarrow \text{Na}^+ + \text{e}^-$
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First Annual 2026 | Section A Q3 | 1 mark

The cathode in an electrolytic cell is always:	Insulated	Positively charged	Negatively charged	Neutral
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Given the standard electrode potentials of aluminum (−1.67 V) and copper (+0.34 V), identify which metal is more reactive? Justify your answer. ایلو مینیم (−1.67V) اور کاپر (+0.34V) کے معیاری الیکٹروڈ پوٹینشل دیے گئے ہیں۔	1+2
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What is electroplating? Give its two uses. الیکٹرو پلٹنگ کیا ہے؟ اس کے دو استعمالات لکھیں۔	03
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State three advantages of a hydrogen–oxygen fuel cell over fossil-fuel. ہائیڈروجن-آکسیجن فیول سیل کے تین فوائد بیان کریں۔ جو فوسل فیول میں نہیں۔	1x3
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Compare the electrolysis of any halide compound in dilute and concentrated solutions. کسی ہیلائیڈ کمپاؤنڈ کی ڈائلوٹ اور کنسنٹریٹڈ سلوشنز میں الیکٹرولیس کا موازنہ کریں۔	2+2
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Which half reaction will occur at cathode? کون سا نصف رد عمل کیتھوڈ پر واقع ہوگا؟	$\text{Cu} \rightarrow \text{Cu}^{2+} + 2\text{e}^-$	$\text{Zn} \rightarrow \text{Zn}^{2+} + 2\text{e}^-$	$\text{Ag}^+ + \text{e}^- \rightarrow \text{Ag}$	$\text{Fe} \rightarrow \text{Fe}^{3+} + 3\text{e}^-$
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In an electrolytic cell oxidation reaction occurs at:	Nowhere	Anode	Cathode	Electrolyte
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Write the chemical reactions occurring in a hydrogen–oxygen fuel cell. Also give reaction at anode and cathode. ہائیڈروجن-آکسیجن فیول سیل میں رونے والے کیمیائی رد عمل لکھیں۔ انوڈ اور کیتھوڈ پر	1x3
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Which metal is commonly used for chrome plating? Give its chemical reactions at anode and cathode. کروم پلٹنگ کے لیے عام طور پر کون سی دھات استعمال کی جاتی ہے؟ اس میں اینوڈ اور کیتھوڈ پر رونے والے کیمیائی رد عمل لکھیں۔	03
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Sketch a schematic diagram of Daniel cell. ڈینیئل سیل کی شماتیکی ڈائیگرام بنائیں۔	03
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Q.3 Give comparison of hydrogen oxygen fuel cells with gasoline/petrol engines. (Four points) ہائیڈروجن-آکسیجن فیول سیلز اور گیسولین/پٹرول انجینوں کا موازنہ پیش کریں۔ (چار پوائنٹس)	04
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